CLAIMS

1. A membrane body of sp^3-bonded boron nitride excellent in field electron emission obtained by vapor-phase deposition in which a surface texture allowing excellent in field electron emission is formed in a self-organized manner.

2. A membrane body of sp^3-bonded boron nitride as described in Claim 1 excellent in field electron emission wherein the surface texture allowing excellent in field electron emission comprises discrete dots of protrusions each having a sharp tip end.

3. A membrane body of sp^3-bonded boron nitride as described in Claim 1 or 2 excellent in field electron emission wherein the discrete dots of protrusions are separated from each other at an interval or distributed at a density suitable for field electron emission.

4. A membrane body of sp^3-bonded boron nitride as described in any one of Claims 1 to 3 excellent in field electron emission, characterized in which comprises polytype boron nitride such as 5H type or 6H type boron nitride.

5. A membrane body of sp^3-bonded boron nitride as described in any one of Claims 1 to 4 excellent in field electron emission which is formed on a substrate as a result of vapor-phase reaction excited by a UV beam.

6. A method for producing a membrane body of sp^3-

bonded boron nitride excellent in field electron emission, characterized in comprising the steps of introducing a reactive gas including a boron source and a nitrogen source whose pressure is adjusted to 0.001 to 760 Torr into a reaction system; adjusting the temperature of a substrate in the reaction chamber to fall between room temperature and 1300°C; radiating a UV beam onto the substrate with or without the concomitant existence of plasma; and forming via vapor-phase reaction a membrane on the substrate in which a surface texture allowing excellent field electron emission is formed in a self-organized manner.

7. A method as described in Claim 6 for producing a membrane body of sp^3-bonded boron nitride excellent in field electron emission wherein the reaction gas is obtained via the dilution by a diluting gas such as a rare gas or hydrogen gas or their mixture, the dilution occurring by mixing the reaction gas with the diluting gas at a volume ratio of 0.0001 - 100 to 100.

8. A method as described in Claim 6 or 7 for producing a membrane body of sp^3-bonded boron nitride excellent in field electron emission wherein the reactive gas comprises diborane as a boron source and ammonia as a nitrogen source.

9. A method as described in Claim 6 for producing a membrane body of sp^3-bonded boron nitride excellent in field electron emission, characterized in which the UV beam occurs as pulsed laser.

10. A method as described in any one of Claim 6 to 9 for producing a membrane body of sp^3-bonded boron nitride excellent in field electron emission, characterized wherein the membrane body of sp^3-bonded boron nitride excellent in field electron emission comprises polytype boron nitride such as 5H type or 6H type boron nitride.

11. A method as described in any one of Claim 1 to 4 for producing a membrane body of sp^3-bonded boron nitride excellent in field electron emission, characterized in which is used as a material for electron emission.